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5/21/03

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re the PATENT application of

Jeffrey S. HAGGARD

Serial No.: 09/529,391 Group Art Unit: 1733

Filed: June 6, 2000 Examiner: Yao, S.

DECLARATION UNDER 37 C.F.R. § 1.132

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450
Sir:

JEFFREY S. HAGGARD declares that:

1. I graduated from the University of Florida in 1981, receiving a Batchelor of Science Degree in Mechanical Engineering.

2. I have been employed by Hills, Inc. for the last 14 years and have been engaged in the research and development of nonwoven spunbond fiber technologies. I am presently the Vice President of Technology at Hills, Inc.

3. I am a co-inventor for the subject U.S. patent application, and I am familiar with the Office Actions, and rejections therein, relating to the subject application and dated September 6, 2002 and February 21, 2003.

4. I conducted the following tests to show the effectiveness of in-line fiber splitting when utilizing different combinations of polymer components with varying heat shrinkage characteristics. In particular, fibers including different polymer components were extruded in a spunbond process and then heated in-line with a heat gun. The heat-treated fibers were examined to determine which polymer component fiber combinations split. The amount of shrinkage of each polymer component was also determined by subjecting individual fibers including one of the polymer components of interest to heat

while under tension to simulate in-line processing conditions, and the percentage of heat shrinkage was obtained based upon the difference in fiber length before and after heat treatment. The test results are provided in the following two tables:

TESTING OF FIBER COMPONENT COMBINATIONS WHICH SPLIT

Polymer Combination	Fiber Cross-Section	Result
Nylon-6 / PET	16 component segmented pie	No splitting of segments
PET / PP	64 segment ribbon	No splitting of segments
Nylon-6 / PET	11 segment stripe	No splitting of segments
PP / TPU	Trilobal segments	Splitting of segments
PP / PEBAX®	Trilobal segments	Splitting of segments
Modified PET / PP	10 segment ribbon	Splitting of segments

PERCENT SHRINKAGE OF POLYMER COMPONENTS EXPOSED TO HEAT WHILE UNDER TENSION

Polymer Component	Percent Shrinkage
PP	0%
Nylon-6	0%
PET	5.6%
TPU	19%
PEBAX®	24%
Modified PET	23%

Where: PET refers to polyethylene terephthalate;
Modified PET refers to polyethylene terephthalate modified with isophthalic acid;
PP refers to polypropylene;
TPU refers to thermoplastic polyurethane; and
PEBAX® refers to a polyether-block co-polyamide polymer resin.

5. In conclusion, it is readily apparent from the test results that a PET (unmodified) / polypropylene fiber combination has a heat shrinkage differential of less than 10% and will not split when subjected to heat. In contrast, when utilizing a modified PET / polypropylene fiber combination, the fiber segments split and the heat shrinkage

differential is well over 10%. The test further shows that other polymer combinations with heat shrinkage differentials greater than 10% and capable of splitting in-line when exposed to heat are PP/TPU and PP/ PEBAX®.

6. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: 5-12-03 By: _____
Jeffrey S. Haggard

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Sir:

W. JOHN G. MCCULLOCH declares that:

1. I received Batchelor's and Master's Degrees of Science in Physical Chemistry from the University of Manitoba in 1950 and 1951, respectively, and a PhD degree in Physical Chemistry from Rensselaer Polytechnic Institute in 1955.

2. I was employed by Exxon Chemical Corporation from 1953 to 1991 in the area of polymer science technology. In addition, I have been a consultant to international and domestic companies from 1992 until present in the field of nonwoven synthetic fiber production. As a consequence of working in these capacities closely with engineers and scientists, I am well aware of the level of one having ordinary skill in the art in polymer science technologies in general and in nonwoven synthetic fiber production in particular.

3. I am familiar with the in-line fiber splitting process described in the subject U.S. patent application and pending claims, and with the Office Actions, and rejections therein, relating to the subject application and dated September 6, 2002 and February 21, 2003. I am also familiar with the following U.S. patent references cited in the Office Actions: U.S. Patent No. 5,759,926 to Pike et al. (hereinafter referred to as

"Pike"), and U.S. Patent No. 5,790,926 to Mizoe et al. (hereinafter referred to as "Mizoe").

4. It is my opinion that the method disclosed in Pike is significantly different from the method of the subject application, and that this difference would easily be recognized by persons having ordinary skill in the art of nonwoven fiber production. In particular, Pike requires the use of a hydrophilic material, or a hydrophobic material that is hydrophilically modified with specific surfactants, so that moisture in the form of steam or hot water swells the hydrophilic component to separate the fibers into two components. Pike further requires that the polymer components have a solubility parameter difference of at least about 0.5 $(cal/cm^3)^{1/2}$. Comparative Examples 1-3 of Pike clearly show that, in the absence of a hydrophilic or hydrophilically modified polymer component, no splitting occurs. In contrast to Pike, the method of the subject application requires a sufficient relative difference in heat shrinkage between first and second materials of the fiber, rather than a difference in hydrophilicity and solubility parameter, to effect separation of fiber components when heat is applied to the fiber. Further, the pending claims require a difference in heat shrinkage of at least about 10% between polymer components in the fiber splitting process, which is a feature not disclosed in Pike because Pike is not concerned at all with heat shrinkage to split segments of a fiber.

5. Another important difference between the method of Pike and the method of the subject application is that Pike requires the use of steam or hot water to swell the hydrophilic component and effect separation of the fiber components. In reviewing Comparative Example 5 of Pike, it is apparent that heat alone will not cause the fibers of Pike to split. Rather, a combination of heat and moisture is required by Pike to induce splitting of the fibers. In contrast, the method of the subject application does not require the use of moisture to achieve separation of fiber components. Because Pike discloses an entirely different method for splitting fibers in comparison to the claimed method of the subject application, it is my opinion that persons having ordinary skill in the nonwoven fiber production art would recognize that Pike alone is not sufficient to anticipate or render obvious the claims of the subject application.

6. It is also my opinion that persons having ordinary skill in the nonwoven fiber production art would recognize that the disclosure of Mizoe fails to provide any supplemental information that could be combined with Pike to suggest the in-line splitting method of the subject application. In particular, Mizoe briefly describes, at Col.

5, lines 38-60, that split fibers may be obtained by splitting a material utilizing a difference in the rate of heat shrinkage. There is no disclosure in Mizoe that fibers can be split in-line with fiber extrusion, or that a sufficient heat shrinkage differential is required to achieve such in-line fiber splitting as described and claimed in the subject application. In fact, Mizoe does not disclose any specific fiber splitting method or difference in heat shrinkage required between different polymer components to achieve splitting of fibers. Further, the use of a difference in rate of heat shrinkage as described in Mizoe is different from the differential heat shrinkage described and claimed in the subject application.

7. In conclusion, it is my opinion, based upon my extensive experience in the field of nonwoven polymer fiber production, that persons having ordinary skill in the nonwoven fiber production art would recognize that no combination of the methods described in Pike and Mizoe would render obvious the in-line splitting method as described and claimed in the subject application. As previously noted, the fiber splitting method described in Pike relies upon the hydrophilicity and solubility parameters for the polymer components of the fiber, which is completely different from the differential heat shrinkage feature relied upon in the method of the subject application. In addition, while Mizoe generally describes splitting fibers due to differences in heat shrinkage, there is no specific disclosure in Mizoe for achieving fiber splitting in-line with fiber extrusion or any degree of differential heat shrinkage required to achieve such in-line splitting.

8. I further declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: May 15, 2003 By: W. John G. McCulloch

W. John G. McCulloch